

Lesson 6-2

Infants and Children

Objectives

Objectives Legend

C=Cognitive P=Psychomotor A=Affective

1 = Knowledge level

2 = Application level

3 = Problem-solving level

Cognitive Objectives

At the completion of this lesson, the CFR student will be able to:

- 6-2.1 Describe differences in anatomy and physiology of the infant, child, and adult patient. (C-1)
- 6-2.2 Assess and provide care to an ill or injured infant or child with: (C-1)
 - Respiratory distress
 - Shock (hypoperfusion)
 - Cardiac arrest
 - Seizures
 - Trauma
- 6-2.3 Summarize the signs and symptoms of possible child abuse and neglect. (C-1)
- 6-2.4 Describe the medical - legal responsibilities in suspected child abuse. (C-1)

Affective Objectives

At the completion of this lesson, the CFR student will be able to:

- 6-2.5 Attend to the feelings of the family when dealing with an ill or injured infant or child. (A-1)
- 6-2.6 Understand the provider's own emotional response to caring for infants or children. (A-1)
- 6-2.7 Demonstrate a caring attitude towards infants and children with illness or injury who require emergency medical services. (A-3)

Psychomotor Objectives

At the completion of this lesson, the CFR student will be able to:

- 6-2.8 Demonstrate assessment of the infant and child. (P-1,2)

Preparation

Motivation:

Infant and child patients often cause anxiety for the CFR. This is caused by a lack of dealing with this special population as well as a fear of failure. Understanding the special considerations in dealing with pediatric patients is important in their emergency medical care.

Prerequisites:

Airway, Patient Assessment, and Circulation Modules

Materials

AV Equipment:

Utilize various audio-visual materials relating to emergency medical care. The continuous development of new audio-visual materials relating to EMS requires careful review to determine which best meet the needs of the program. Materials should be edited to ensure that the objectives of the curriculum are met.

EMS Equipment:

None.

Personnel

Primary Instructor:

One EMT-B Instructor knowledgeable with infants and children.

Assistant Instructor:

The instructor-to-student ratio should be 1:6 for psychomotor skills practice. Individuals used as assistant instructors should be knowledgeable in infant and child emergencies.

Recommended Minimum Time to Complete:

One and a half hours.

Presentation

Declarative (What)

- I. Anatomical and Physiological Concerns
 - A. Small airways are easily blocked by secretions and airway swelling.
 - B. Tongue is large relative to small mandible and can block airway in an unresponsive infant or child.
 - C. Positioning the airway is different in infants and children, do not hyperextend the neck.
 - D. Infants are nose breathers, so suctioning a secretion - filled nasopharynx with a bulb syringe can improve breathing problems in an infant.
 - E. Children can compensate well for short periods of time for respiratory problems and shock.
 - 1. Compensate by increasing breathing rate and increasing effort of breathing.
 - 2. Compensation is followed rapidly by decompensation due to rapid respiratory muscle fatigue and general fatigue.
 - F. Risk of hypothermia; keep them warm.
- II. Airway
 - A. Essential skills - review from module 2-1, Airway, with emphasis on infants and children.
 - 1. Airway opening
 - a. Position to open airway is different - head-tilt chin-lift - do not hyperextend.
 - b. Place a folded towel under the shoulders to assist in maintaining position.
 - c. Jaw thrust with spinal stabilization
 - 2. Suctioning
 - a. Sizing
 - b. Depth
 - c. Technique
 - d. Use of the bulb syringe
 - 3. Clearing complete obstructions

Follow the Nationally Approved Guidelines of Foreign Body airway Obstructions in the infant and child
 - B. Airway adjuncts
 - 1. Oral airways
 - a. Adjunct, not for initial artificial ventilation
 - b. Patient should not have a gag reflex
 - c. Sizing - corner of the mouth to the tip of the ear
 - d. Techniques of insertion - use tongue depressor.
 - (1) Insert tongue blade to the base of tongue.

- (2) Push down against the base of tongue while lifting upward.
- (3) Insert oropharyngeal airway following the anatomic curve (upright) without rotation.
2. Nasal airways are usually not used in children by CFRs

III. Assessment

- A. General impression of well versus sick child can be obtained from overall appearance.
 1. Assess mental status.
 2. Effort of breathing
 3. Color
 4. Quality of cry/speech
 5. Interaction with environment and parents
 - a. Normal behavior for child of this age.
 - b. Playing
 - c. Moving around
 - d. Attentive versus non-attentive
 - e. Eye contact
 - f. Recognizes parents
 - g. Responds to parents calling
 6. Emotional state (crying, upset, scared)
 7. Response to the CFR
 8. Tone/body position
- B. Approach to evaluation
 1. Begin assessment from across the room using Pediatric Assessment Triangle
 - a. Observe for mechanism of injury
 - b. Assess the surroundings
 - c. Respiratory assessment includes:
 - (1) Chest expansion/symmetry/air entry
 - (2) Effort of breathing
 - (3) Nasal flaring
 - (4) Stridor (high pitched inspiratory sound), crowing, or noisy
 - (5) Retractions
 - (6) Grunting
 - (7) Respiratory rate
 2. Hands-on approach to infant or child patient assessment
 - a. Palpate brachial or femoral pulse
 - b. Compare central and distal pulses
 - c. Assess skin color, temperature, and condition

IV. Common Problems in Infants and Children

A. Airway obstructions

1. Partial airway obstruction - infant or child who is alert and sitting.
 - a. Stridor (high pitched inspiratory sound), crowing, or noisy
 - b. Retractions on inspiration
 - c. Pink
 - d. Good peripheral perfusion
 - e. Still alert, not unresponsive.
 - f. Emergency medical care
 - (1) Allow position of comfort; assist younger child to sit up; do not lay down. May sit on parent's lap.
 - (2) Do not agitate child
2. Complete obstruction and altered mental status or cyanosis and partial obstruction
 - a. No crying or speaking and cyanosis
 - (1) Child's cough becomes ineffective
 - (2) Increased respiratory difficulty accompanied by stridor (high pitched inspiratory sound)
 - (3) Patient loses responsiveness
 - (4) Altered mental status
 - b. Clear airway.
 - (1) Infant foreign body procedures
 - (2) Child foreign body procedures
 - c. Attempt artificial ventilations.
3. Obstruction Cleared - transport patient in position of comfort

B. Respiratory emergencies

1. Respiratory distress precedes respiratory failure and is indicated by any of the following:
 - a. Respiratory rate >60 in infants
 - b. Respiratory rate > 30/40 in children
 - c. Nasal flaring
 - d. Intercostal retraction (between the ribs), supraclavicular (neck muscles), subcostal retractions (below the margin of the rib)
 - e. Stridor (high pitched inspiratory sound)
 - f. Cyanosis
 - g. Altered mental status (combative, decreased mental status, unresponsive)
 - h. Grunting
2. Respiratory failure/arrest
 - a. Breathing rate less than 10 per minute in a child
 - b. Breathing rate of less than 20 per minute in an infant
 - c. Limp muscle tone
 - d. Unresponsive
 - e. Slower, absent heart rate
 - f. Weak or absent distal pulses
 - g. Cyanosis and a slow heart rate

3. Role of the CFR
 - a. Complete the CFR assessment
 - (1) Complete a scene size-up before initiating emergency medical care.
 - (2) Complete an initial assessment on all patients.
 - (3) Apply oxygen if needed
 - (4) Complete a physical exam as needed.
 - (5) Complete on-going assessments.
 - b. Provide ventilatory support as needed
 - (1) Supplemental oxygen via non-rebreather mask for respiratory distress
 - (2) Bag-valve-mask with high concentration oxygen for respiratory failure or arrest (mouth to mask or barrier device may be used if bag-valve-mask device is unavailable)
 - c. Observe heart rate
- C. Circulatory failure
 1. Circulatory failure that is uncorrected is also a common cause of cardiac arrest in infants and children
 2. Signs and symptoms of circulatory failure
 - a. Increased heart rate
 - b. Central pulses stronger than peripheral pulses
 - c. Signs of poor skin perfusion (pale, cool, mottled)
 - d. Mental status changes
 3. Role of the CFR
 - a. Complete the CFR assessment
 - (1) Complete a scene size-up before initiating emergency medical care.
 - (2) Complete an initial assessment on all patients.
 - (a) Support oxygenation and ventilation
 - (b) Observe for signs of cardiac arrest
 - (c) Keep warm
- D. Seizures
 1. Seizures, including seizures caused by fever (febrile), should be considered potentially life-threatening.
 2. May be brief or prolonged.
 3. Assess for injuries which may have occurred during seizures.
 4. Caused by a variety of conditions
 - a. Fever
 - b. Infections
 - c. Poisoning
 - d. Low blood sugar
 - e. Trauma
 - f. Decreased levels of oxygen
 - g. Could be the result of an unknown cause in children.

5. History of seizures. Ask the following questions:
 - a. Has the child had prior seizure(s)?
 - b. If yes, is this the child's normal seizure pattern?
 - c. Is the child on a seizure medications?
 - d. Could the child have ingested any other medications?
 6. Role of the CFR
 - a. Complete the CFR assessment
 - (1) Complete a scene size-up before initiating emergency medical care.
 - (2) Complete an initial assessment on all patients.
 - (3) Apply oxygen if not already done so.
 - (4) Complete a physical exam as needed.
 - (5) Complete on-going assessments.
 - (6) Observe and describe the seizure.
 - b. Comfort, calm, and reassure the patient while awaiting additional EMS resources.
 - (1) Protect the patient from the environment.
 - (2) Ask bystanders (except parents) to leave the area.
 - (3) Assure patency of airway.
 - (4) Place patient in the recovery position if no possibility of spine trauma.
 - (5) Never restrain the patient.
 - (6) Do not put anything in the patient's mouth.
 - (7) Have suction available.
 - (8) If the patient is bluish, assure airway and artificially ventilate.
 - (9) Report assessment findings to additional EMS responses
 7. Relationship to Airway Module
 - a. Often seizure patients will have significant oral secretions.
 - b. It is essential that these patients be placed in the recovery position when the convulsions have ended.
 - c. Patients who are actively seizing, bluish, and breathing inadequately should be ventilated, if possible.
- E. Altered mental status
1. Caused by a variety of conditions
 - a. Low blood sugar
 - b. High blood sugar
 - c. Poisoning
 - d. Post seizure
 - e. Infection
 - f. Head trauma
 - g. Decreased oxygen levels
 2. Role of the CFR
 - a. Complete the CFR assessment
 - (1) Complete a scene size-up before initiating emergency medical care.
 - (2) Complete an initial assessment on all patients.

- (3) Apply oxygen if not already done.
 - (4) Complete a physical exam as needed.
 - (5) Complete on-going assessments.
 - b. Comfort, calm, and reassure the patient while awaiting additional EMS resources.
 - (1) Assure patency of airway.
 - (2) Be prepared to artificially ventilate/suction and oxygenate.
 - (3) Place in recovery position.
- F. Sudden infant death syndrome (SIDS)
 - 1. Signs and symptoms
 - a. Sudden death of infants in the first five months of life.
 - b. Causes are not clearly understood.
 - c. Baby is most commonly discovered in the early morning.
 - 2. Role of the CFR
 - a. Complete the CFR assessment
 - (1) Complete a scene size-up before initiating emergency medical care.
 - (2) Complete an initial assessment on all patients.
 - b. Comfort, calm, and reassure the parents while awaiting additional EMS resources.
 - (1) Try to resuscitate unless the baby is stiff.
 - (2) Parents will be in agony from emotional distress, remorse, and guilt.
 - (3) Avoid any comments that might suggest blame to the parents.

III. Trauma

- A. Injuries are the leading cause of death in infants and children.
- B. Blunt injury is most common.
- C. The pattern of injury may be different from adults.
 - 1. Motor vehicle crashes
 - a. Motor vehicle passengers
 - (1) Unrestrained passengers have head and neck injuries.
 - (2) Restrained passengers have abdominal and lower spine injuries.
 - (3) Infant and booster seats are often improperly fastened, resulting in head and neck injuries.
 - b. Struck while riding bicycle - head injury, spinal injury, abdominal injury
 - c. Pedestrian struck by vehicle - abdominal injury with internal bleeding, possibly painful, swollen, deformed thigh, head injury.
 - 2. Falls from height, diving into shallow water - head and neck injuries
 - 3. Burns -
 - 4. Sports injuries - head and neck
 - 5. Child abuse and neglect

- D. Specific body systems
 - 1. Head
 - a. Proportionally larger and more easily injured.
 - b. The single most important maneuver is to ensure an open airway by means of the jaw thrust.
 - 2. Chest
 - a. Children have very soft pliable ribs.
 - b. There may be significant injuries without external signs.
 - 3. Abdomen
 - a. More common site of injury in children than adults.
 - b. Often a source of hidden injury.
 - 4. Extremities - extremity injuries are managed in the same manner as for adults.
 - 5. Role of the CFR
 - a. Complete the CFR assessment
 - (1) Complete a scene size-up before initiating emergency medical care.
 - (2) Complete an initial assessment on all patients.
 - (3) Apply oxygen if needed.
 - (4) Complete a physical exam as needed.
 - (5) Complete on-going assessments.
 - b. Comfort, calm, and reassure the patient while awaiting additional EMS resources
 - (1) Assure airway position and patency. Use jaw thrust.
 - (2) Suction as necessary with large bore suction catheter.
 - (3) Provide spinal stabilization.
 - (4) Support and maintain oxygen therapy
 - (5) Manually stabilize extremity injuries
- IV. Child Abuse and Neglect
 - A. Definition of abuse - improper or excessive action so as to injure or cause harm.
 - B. Definition of neglect - giving insufficient attention or respect to someone who has a claim to that attention.
 - C. CFR must be aware of condition to be able to recognize the problem.
 - D. Physical abuse and neglect are the two forms of child abuse that the CFR is likely to suspect.
 - E. Signs and symptoms of abuse
 - 1. Multiple bruises in various stages of healing.
 - 2. Injury inconsistent with mechanism described.
 - 3. Patterns of injury
 - a. Cigarette burns
 - b. Whip marks
 - c. Hand prints
 - 4. Repeated calls to the same address.

5. Fresh burns.
 - a. Not just any burns
 - (1) Scalding
 - (2) Glove, dip pattern
 - b. Burns inconsistent with the history presented
 - c. Untreated burns
6. Parents seem inappropriately unconcerned or overly concerned.
7. Conflicting stories
8. Fear on the part of the child to discuss how the injury occurred.
9. CNS injuries - shaken baby syndrome
 - a. Unresponsive/seizure
 - b. Severe internal injuries
 - c. No evidence of external injuries
- F. Signs and symptoms of neglect
 1. Lack of adult supervision.
 2. Malnourished appearing child.
 3. Unsafe living environment
 4. Untreated chronic illness; e.g., asthmatic with no medications.
 5. Untreated soft tissue injuries
- G. Do not accuse in the field
 1. Accusation and confrontation delays transportation.
 2. Report objective information to the transporting unit.
- H. Reporting required by state law
 1. Local regulations
 2. Remain objective
 - a. Report what you see and what you hear
 - b. Do not comment on what you think.
- V. Need for CFR Debriefing
 - A. Especially in cases of abuse/neglect
 - B. Serious injury/death of a child

Application

Procedural (How)

1. Demonstrate the techniques of opening the airway of an infant or child.
2. Demonstrate the techniques of suctioning an infant or child.
3. Demonstrate the techniques for removing a foreign body airway obstruction in an infant or child.
4. Demonstrate ventilating infants and children.
5. Demonstrate assessment of the infant and child.
6. Demonstrate the management of partial and complete airway obstructions in infants and children.
7. Demonstrate the management of respiratory distress and respiratory arrest in infants and children.

8. Demonstrate the management of seizures, altered mental status, and sudden infant death syndrome (SIDS).

Contextual (When, Where, Why)

The CFR must have an understanding of the unique aspects of dealing with infants and children. In addition, the CFR must realize the aspect of having multiple patients. A child cannot be cared for isolated from the family. A calm, professional, reassuring CFR may help to minimize psychological impact of transport to parent and child.

Student Activities

Auditory (Hearing)

1. Students should hear various infant and child airway sounds.
2. Students should hear parent information.

Visual (Seeing)

1. Students should see audio-visual materials of infant and child patients with common medical or traumatic complaints.
2. Students should see various infant or child equipment.

Kinesthetic (Doing)

1. Students should practice the techniques of opening the airway of an infant or child.
2. Students should practice the techniques of suctioning an infant or child.
3. Students should practice the techniques for removing of a foreign body airway obstruction in an infant or child.
4. Students should practice ventilating infants and children.
5. Students should practice the assessment of the infant and child.
6. Students should practice the management of partial and complete airway obstructions in infants and children.
7. Students should practice the management of respiratory distress and respiratory arrest in infants and children.
8. Students should practice the management of seizures, altered mental status, and sudden infant death syndrome (SIDS).

Instructor Activities

Facilitate discussion and supervise practice.

Reinforce student progress in cognitive, affective, and psychomotor domains.

Redirect students having difficulty with content (complete remediation form)

Evaluation

Written:

Develop evaluation instruments, e.g., quizzes, oral reviews, and handouts, to determine if the students have met the cognitive and affective objectives of this lesson.

Practical:

Evaluate the actions of the CFR students during role play, practice, or other skill stations to determine their compliance with the cognitive and affective objectives and their mastery of the psychomotor objectives of this lesson.

Remediation

Identify students or groups of students who are having difficulty with this subject content. Complete remediation sheet from the instructor's course guide.

Enrichment

What is unique in the local area concerning this topic? Complete enrichment sheets from instructor's course guide and attach with lesson plan.